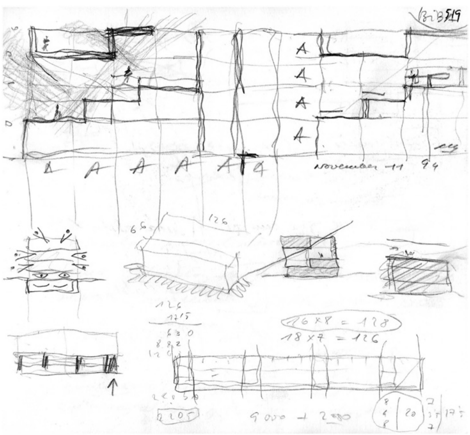
Ideation, representation and notation. The process of architectural design as a dialogue between the architect and architecture mediated through drawing

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Abstract

Since the development of drawing techniques and geometric projections in the Renaissance, architectural drawing has been the most relevant tool to mediate in the design process. Alberti's conception of architectural representation and project anticipated in a practical way the idea of notational systems developed centuries later by Goodman. Thus, architects replaced master builders' professional tradition and gained the recognition for architecture as a liberal art and as a creative endeavour. Their ability to project and represent architecture anticipating not only its visual appearance but also its geometric constitution through drawing introduced a substantial change, allowing architects to convey their design to third parties due to the allographic nature of architectural drawing.
This research attempts to focus on these issues in relation to ideation processes and graphic thinking derived from architects' drawing practice, questioned by some with the advent of digital tools. Sketches have been used by architects to establish a dialogue between them and their architectural creative labour which, to some extent, is triggered by the action of drawing itself. These freehand sketches are based on projections but the looseness and inaccuracy of them renders a degree of openness which is seminal within the architectural design process. These drawings are transformed into presentation drawings during the design process to reach a final form. The second type of drawings properly represent architecture in a more precise and notational way. These two types of drawings could be referred to as 'imaginative' and 'notational' in accordance to their different features, despite they are related to the same architectural referent. Yet, every phase in the project is creative as the project defines and anticipates built architecture.

Keywords
Notation, ideation, process, drawing, architecture



Alberto Campo Baeza. 1995. Dibujos de ideación con aspectos notacionales para el proyecto de la Biblioteca de la Universidad de Alicante, https://www.campobaeza.com/drawings/1995-library-at-the-university-of-alicante/

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Introduction and methodology

Drawings have been a tool to *represent* what we see since the beginning of mankind, defining a relationship between reality and its depiction that is based on visual resemblance. The history of figurative painting could well be summarised as an artistic collective effort dedicated to increasing the accuracy in the way painters were able to portray reality and their development of a graphic narrative intended to convey through images. They managed to create the illusion of a three-dimensional reality depicted on a flat surface thanks to the invention of perspective and chiaroscuro. It is important to remind, however, that the resemblance of the representation is based on projections. This establishes a very especial relation between reality and its graphic representation unmatched by verbal languages which are always based on a generic relation between that same reality and words.

These languages belong to what Nelson Goodman referred to as symbolic systems [Goodman 1976]. He addressed several key issues in relation to *representation* which are important for our research even if we tend to think that his theories are conditioned by the goal he seeks with regard to the symbolic relations of these systems, on the one hand, and a possibly lack of understanding on the precise nature of geometric projections and their influence on visual resemblance. Thus, he questions the validity of resemblance as a "sufficient condition for representation" [Goodman 1976, p. 4] and goes on discussing terms such as imitation, perspective, realism, description and depiction to broaden the nature of representation and extend it beyond resemblance. Obviously, a painter is not only trying to depict what he sees. He may attempt to do so when he tries to paint a still nature or a portrait –being as accurate as his technique allows–, but transcends this goal when he recreates something he was not able to physically experience as is the case with all the paintings with narrative implications such as those describing religious topics, historic events, or even imaginary events or characters. Leonardo did not witness the last supper, which he painted centuries later, nor was Velazquez in Breda when the Dutch surrendered the city –which he painted ten years later–, and yet they both recreated such events.

However, a geometric projection is not really a symbolic representation but a precise correspondence between a point in the three-dimensional realm –be it real, as in the case of material existence or imaginary as in the case of a project to be built– and its twodimensional representation or presentation –we shall address that question below –. Such is the case with the floor plan drawn by Palladio after his survey at the Pantheon (fig. 01). Note that in the case of survey plans, the direction of projection is reversed compared to the drawings of the project that anticipate built architecture. Thus, survey plans are actually a true representation of the original model, as Evans [1989, p.19] has pointed out.

Obviously, a beginner trying to represent an object or a figure that he sees will produce a symbolic representation, he doesn't have the skills to go any further even though we may still find his drawing resembles the model and certainly refers to it. A trained draughtsman will however attempt to draw something which is as accurate as his technique and ability allows him to achieve, something very similar to a projection of the same object based on visual appearance: the more accurate the proportions, the angles and the chiaroscuro effects, the more precise his representation will be. A photographer actually produces an image which is a true projection of the same object on the film (or the digital sensor). But if we know the precise geometry and the dimensions of that object we could make plans based on projections that would be geometrically accurate. Obviously, these projections – be them parallel or drawn in perspective alike – will not be symbolic but precisely geometric and completely truthful, despite the claims made by Panofsky with regard to forms of representations as symbolic forms [Panfosky 2012]. As Carlos Montes [2007, p. 35] has suggested, Panofsky's conception has been widely criticised by many. Gombrich, analysing art through the lenses of the psychology of perception explained more convincingly why styles and forms of representation evolved throughout history, thus questioning Panfosky's approach based on the history of philosophy [Gombrich 1982].

Although descriptive geometry would be later developed by Desargues and Monge, Renaissance architects did already properly and concisely draw parallel projections as a means of precise architectural representation. In a well-known letter by Raphael addressed to Pope Leo

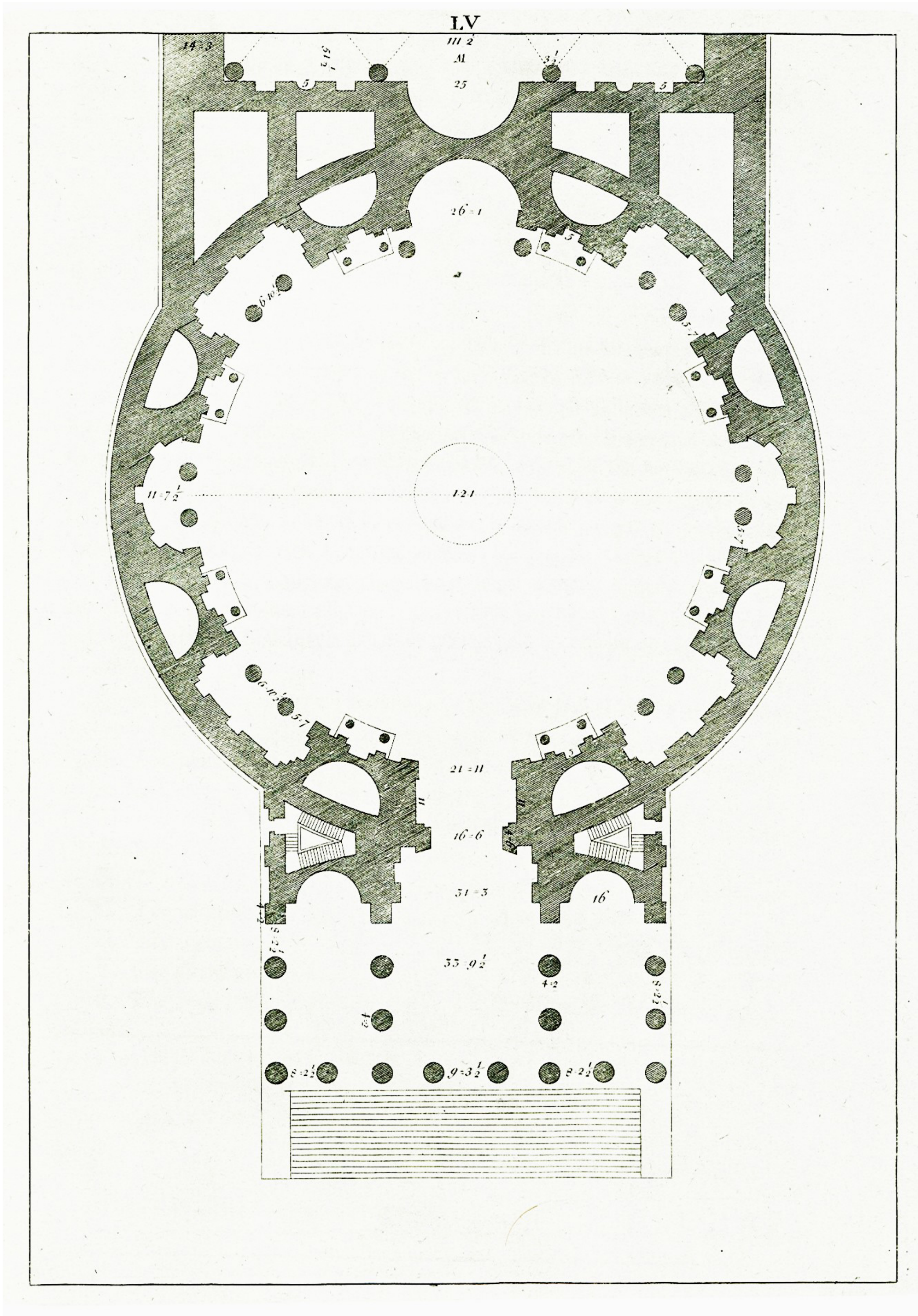


Fig. 01. Andrea Palladio. Pantheon (surveyed floor plan). Book IV, Chapter XX, Plate LV, Available at: https://upload.wikimedia.org/wikipedia/commons/d/d5/Pantheon_Palladio.jpg

X [Hart, Hicks 2006] the conventional canon of architectural representation used for centuries based on floor plans, sections and elevations is already set.
However, Alberti was probably the inventor of the project as a document based on these types of drawings that could be described as a thorough and consistent notational system [Carpo 2011]. This allowed architects to be freed from their constant supervision on the building site,

their heavy work as masons that characterised part of their activity during the middle ages, as well as rising their creative task to the rank of the noblest art.

Goodman also established a distinction that is relevant to our purpose between *autographic* and *allographic* arts. The first are those such as painting or draughtsmanship where original and forgery are clearly distinct and significant [Goodman 1976, p.113]; that is the reason why originals maybe priceless in comparison to forgeries. Allographic arts, on the contrary, such as music or architecture, use notational languages – such as musical scores and architectural plans – so that others may interpret the coded information that they contain [Marcos, Swisher 2020]. Alberti established a distinction between perspectival representation – which he considered the realm of the painter – and true magnitude drawings or proper projections – which were to be used by architects to avoid perspectival distortions dealing with true proportions – [Alberti 1991, p. 95]. This kind of precise notational information contained in plans allows third parties to build architecture.

However, architectural ideation drawings produced by architects during the inception stages do not fit under Goodman's classification as they are more imaginative and open than they are descriptive and precise and yet both, ideation drawings and plans [Bafna 2008], refer to the same architectural referent defined in the project at different stages of the design. In fact, Goodman's allographic attribution to architecture is based on the notational nature of architectural plans but certainly ideation sketches seem to be rather autographic.

The methodological approach in this research is based on a theoretical endeavour based on concepts such as *ideation, representation, notation* and *process* applied to architectural drawing. It uses graphic examples to illustrate the statements made as well as to analyse them, thus empirically testing the claims made throughout the paper.

Discussion

It is interesting to reflect on the aforementioned concepts applied to the process of architectural design. As will be addressed in the discussion, Goodman's theories are not always applicable to architecture if we consider the whole process of the design and conceive the project as an evolving work that is founded on *formativity*, according to Pareyson's homonymous theory [1987]. Although some points are interesting others do not stand a confrontation to reality.

Ideation drawings as autographic and imaginative manifestations in the inception phase of design

Genuinely, ideation drawings (fig. 02) are self-absorbed architectural manifestations; truly, the embodiment of graphic thinking as a creative and reflective ongoing process. They are unequivocally autographic realizations which defy Goodman's allographic attribution to architecture. To a certain extent, these kinds of drawings are the most authorial production of the architect as, in contrast to the plans that could be rendered by other members of the team during the development stages of the project, they are genuinely the work of the architect in his creative dimension: giving form to architecture; drawing what may not be seen but rather the form that

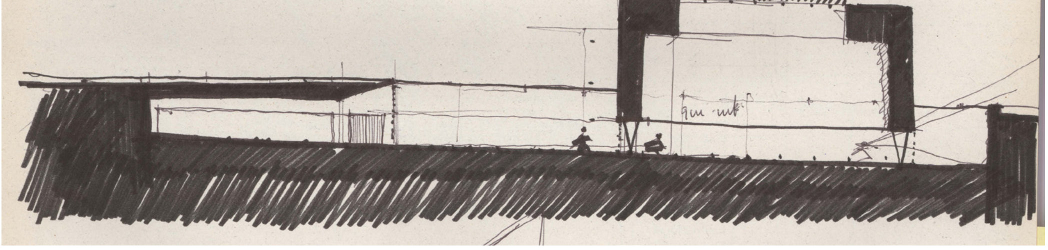
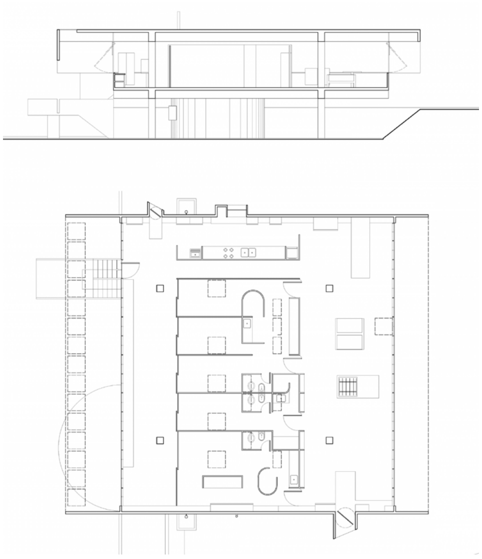


Fig. 02. Alfredo Payá. 1998. Ideation section drawing for the Museum of the University. (permission to use it by its author, Alfredo Payá)

is yet to unfold. They are an intimate harbor of the designer who intends to swiftly capture architectural concepts on a paper inevitably resorting to the fugacity of his imagination.
This dialogue is not addressed to anyone in particular, it is more the extension of a thought in a graphic form, a monologue in the form of an ongoing selfinterrogatory. The germinal substrate of the project is founded in these first formal babbling lines as the strokes on the paper are fundamentally gestures, traits of a form that is yet to come, a primary and rough form that is nevertheless pregnant with the essence of the project and is transformed along the creative process. These drawings are clearly not notational but autographic; as they have been made with a certain degree of openness or ambiguity; they are deliberately vague. These drawings may be regarded as "imaginative" drawings.

Architectural plans as allographic and notational manifestations in the development phase of design

According to Bafna, plans, on the other hand, can be understood in their *notational* dimension and may be paralleled to scripts or scores [Bafna 2008, p.536]. They should include textual symbols that are identifiable and discrete such as dimensions, measures and notes establishing relationships with a set of non-discrete references. These plans correspond to the development phase of the project, which emerges out of the ideation inception drawings.
They are produced following Alberti's notational invention and are executed to transmit a set of instructions strictly regulated with a specific meaning. They are precise and clear, including disambiguating indicators such as scale, orientation, dimension, line-weights, etc. (fig. 03).
Unlike ideation drawings, they are intended for third parties: the builder should be able to construct the architecture they define. Thus, these plans are commonly used in the production of buildings; their rendering relies on technical and standardized procedures; typically, computer drawings nowadays.
These two types of drawings could be referred to as 'imaginative' and 'notational' following the wording used by Bafna; many would agree with this description. It is to be noted that both type of drawings are equally part of a creative process even if we tend to think that only ideation ones are, in fact, related to creativity, whereas the technical plans seem more the work of an engineer observing their concision. The whole invention of the notational document – the project devised by Alberti – that should serve as an alternative representation of architecture relies on the autonomy of the document and its capacity to stand for architecture with such precision as to precisely anticipate it so as to be able to be unequivocally interpreted and built accordingly. The architect's role is not just to give shape to architecture but also to define the constructive systems that render it possible. This is where the disputed term of *representation* applied to the architectural project as a whole is confusing. According to Boudon, rather than speaking of *representation* when the project itself anticipates the building, we should more accurately describe it as *presentation* [Boudon, Pousin 1993]. This could be a modern reinterpretation of Boullée's famous definition of architecture as contained in the drawings more than in the building itself, as the plans are the cause and the building its consequence [Boullée 1972, p.63]. If we were to be strictly precise, every drawing that is part of the process of design at any stage, regardless of its autographic and imaginative or allographic and notational nature, should not be considered a representation but rather an anticipation of architectural form or a presentation of a completed design, respectively.
Only survey plans should be regarded as purely representational, not even the execution plans are consistent with this categorisation. Both, survey plans or execution architectural drawings are genuinely allographic and notational, adding the fact that they both possess a projective nature and therefore geometric accuracy, something Goodman seems to obviate, thus transcending the merely symbolic. But the difference between them depends on their relationship of the the architecture they refer to and the directionality of the projection, as pointed out by Evans [Evans 1989, p.19].



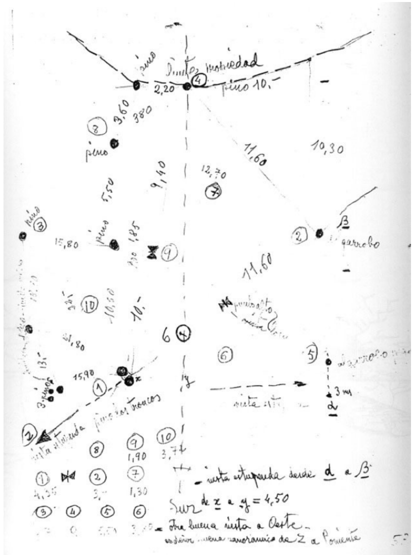


Fig. 03. Mendes da Rocha, 1964. Casa en Butanã. Floor plan and section. Sao Paolo. Available at: https://www.atlasofplaces.com/architecture/casa-butantae/

Fig. 04. José A. Coderch. c. 1951. Preliminary survey plan for Ugalde House. Caldes d'Estrac. Available at: https://circarq.wordpress.com/2019/07/19/casa-ugalde/

Thus survey plans are truly *representations* of built architecture –which already exists– while the architectural plans that form part of a project are strictly speaking a *presentation* of the architecture they anticipate defining the way it should be built, and is, therefore, yet to be embodied into physical spatial existence. It is time and their physical embodiment that which distinguishes both types of drawings, however similar they may seem to the observer considering they use the same notations, codifications and projections.

Notational drawings and topological relations in the inception phase of design

However, if we observe some drawings or sketches that architects may produce we could be puzzled to find out that, in fact, in the very initial inception phases of the project, we may also find notational drawings with enough features as to fit in Goodman's notational systems. If we observe the very first drawing that Coderch drew for the Ugalde house during the first visit to the site we will find measures, notes, description of views, position of trees, etc. (fig. 04). It is obvious that the drawing is almost a collection of notes on the site annotated by Coderch in a synthetic way –which is only partially graphic– aimed to consider them while the germinal phases of the project began to take shape in his imagination and his inception sketches. Their purpose was informative and they were meant for himself – not for third parties despite their notational character– but they also implied an initial attitude towards the site: probably, the first project's decision. In fact, the Ugalde house is a pristine example of modern site-oriented architecture, perfectly integrated in the landscape that takes advantage of the existing magnificent views, trees, topography, etc. The information contained in this survey hand-drawing has enough relevant information as to condition or inspire the drawings to come, and with them, the architecture itself.

In terms of the allographic nature of architecture attributed by Goodman and his comparison with musical scores, even though technical plans could serve to the purpose of establishing a certain parallel between music and architecture with regard to the notational nature of their 'composition', if critically analysed, the comparison lacks of a very relevant differentiation. Even if interpreters may play with their instrument a musical score, the relationship between the notes in the scores and the sounds for which they stand for is totally arbitrary: the codification is merely based on the arbitrariness of the sign, very much like we find in verbal languages. It could be argued that the pentagram shows the varying pitch of the notes (high or low) but, other than that, the rest of the relations is predefined by the signs and the syntax of the language itself.

On the contrary, architectural plans are precise geometric projections that establish a point to point relationship between the drawing and its referent, be it the architecture to be built or a construction already in place that may be surveyed. Thus, there is no arbitrary connection between the referent and its *presentation* –in the case of a project– or *representation* –in the case of a survey plan–. Moreover, even ideation sketches, however vague or ambiguous as they may be –and they are intended to be so– have a connection to their referent, not precise and geometrically accurate, but certainly based on visual resemblance and topologic relations. That is the reason why, for instance, the very first inception sketches for the Ugalde house (fig. 05), related as they are to the analytical notational survey drawing traced by Coderch on the site, still resemble the architecture which they already anticipate, no matter how vaguely or inaccurately: an architect may unravel a good deal of the architecture that was to take form later on in the process of design and, most strikingly, of other possible paths of development they suggest.
Topological relations may certainly be inferred from them but, generally speaking, ideation sketches tend to be based on the same kind of projections –either parallel or even perspectival– as the proper plans, despite their diagrammatic style in the very first stages. Their expressiveness and ambiguity are what renders them so suggestive to other colleagues within the profession.

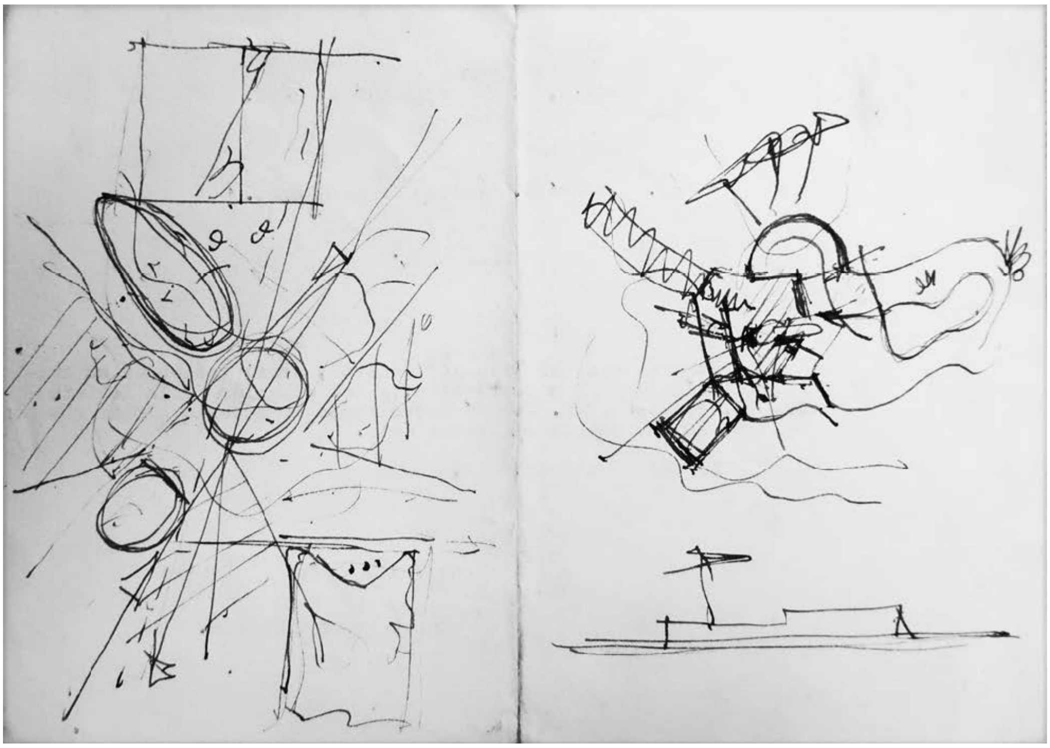


Fig. 05. José A. Coderch. c. 1951. First ideation sketches for Ugalde House. Caldes d'Estrac. Available at: http://www.coac.net/COAC/exposicions/TARRAGONA/2001/coderch19401964/default_e.html

Conclusions

Architects have relied on drawing for centuries both, in the process of inception as well as during the process of development and accurate representation of their projects. Alberti set the standard for architecture as an allographic art based on the use of notational drawings that served to represent and convey architecture to third parties, just in the same way as musical scores are written by composers so that musicians may play their music.
Thus, architects need not to remain on the building site as their plans provided builders the information necessary to construct their architecture, and so, they were freed from the mas-

ter mason medieval tradition and their status became that of an artist and, accordingly, their practice one of intellectual nature.
However, the process of architectural design is complex and progressive. To achieve its final form a work of architecture must undergo several stages in a formative process such as inception design, schematic design, design development and construction documentation. The two initial phases could be regarded as part of the ideation process whereas the other two could be regarded as more descriptive and representational: the development of the design. While during the ideation process architectural drawings establish a dialogue between the author and his work –they are a manifestation of graphic thinking-, during the development stages representational drawings become purely notational. The allographic nature of architecture depends on the latter type of drawings as they are executed to convey others the information needed to build architecture. Thus, the dialogic relationship in these drawings is established between the architect and others –a jury, the builder, a critic, etc.– based on the coded information they contain. Rather than strictly representing the architecture that they embody; these plans are analogous to the way in which scores are the manifestation of composed music. While ideation drawings are more imaginative, open and less accurate, representational drawings are strictly notational, dimensionally accurate and geometrically precise. Computer architectural design has modified some of these relations and, to some extent, the progressiveness of this whole creative process. Although the younger generations in some schools of architecture have been directly weaned on digital tools and it is certainly possible to produce fully digitally designs, we believe that the plasticity and swiftness of the creative process in the inception stages may be undermined. Sketching and the dialogic nature between the architect and his creative endeavour is, in fact, a manifestation of graphic thinking, a cognitive ability that enhances the relationship between our imagination, the pure visual understanding of space and the physicality of the action of drawing itself. Ideation drawings are synthetic and suggestive in ways that are difficult to match through computer design. Moreover, drawing is also a tool to acquire knowledge and analyse reality in a way that words cannot match due to the nature of projections and its special status with regard to materiality. Accordingly, architectural students should keep receiving tuition regarding hand sketching although specifically oriented towards ideation and analysis.

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